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Fish Scales: Scale and Method in Social Science Research for North Pacific and West Coast Fishing Communities

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Under the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA) and other legal mandates, NOAA's National Marine Fisheries Service (NMFS) is conducting basic social science research on fishing communities. This basic research differs from issue-driven social impact assessments in that it does not address pending policy changes or specified locations. As a consequence, NMFS's basic social science research must cover very large geographic scales and address a broad array of analytical issues. These needs are in tension with the traditional ethnographic methods of anthropology and the MSFCMA's focus on the community as a unit of analysis. This paper describes how anthropologists at NMFS's Alaska Fisheries Science Center and Northwest Fisheries Science Center navigate these conflicting imperatives by adopting large-scale community profiling using social and fishing indicators informed by ethnographic site visits, and advocating a "nested-scale" analytical framework that imbricates the community level analytical unit with macro-level considerations related to regional and global forces and micro-level dynamics related to intra-community heterogeneity.

Key words: fisheries, fishing communities, community profiles, social indicators, methodology

Overview

Social impact assessment of fishery management actions, as required by the National Environmental Policy Act (NEPA), the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA), and other legal mandates, is conducted in response to proposed policy changes (or programmatic evaluations) that serve to focus research on the most likely impacted communities and on the most likely relevant factors. Basic social science research conducted by agencies in support of fishery management has far fewer bounds; but such freedom from constraint is a deceptive privilege. Without pre-specified locations or policy proposals, basic social science research at NOAA's National Marine Fisheries Service (NMFS) must cover very large geographic scales and address a broad array of analytical issues in order to support any number of policy actions that might affect any number of social factors in any number of places. These broad needs are in tension with the traditional ethnographic methods of anthropology and the MSFCMA's focus on the community as a unit of analysis.

This paper describes how anthropologists at NMFS's Alaska Fisheries Science Center and Northwest Fisheries Science Center navigate these conflicting imperatives. The marine areas managed within the Pacific Fishery and North Pacific Fishery management regions comprise the entirety of the US west coast's exclusive economic zones (EEZs), some 1,186,800 square miles of ocean and associated marine resources, with more than 2,200 recognized communities in four states. To embrace this geography as fully as possible while maintaining some legacy of anthropological intimacy, we adopted large-scale community profiling methods using social and fishing indicators informed by ethnographic site visits. We also advocate for a "nested-scale" analytical framework that imbricates the community level analytical unit with macro-level considerations related to regional and global forces and micro-level dynamics related to intra-community heterogeneity.

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Anthropologists working in academic institutions have long been interested in the sociocultural aspects of fishing practices and fishing communities (e.g., Acheson 1975; McCay 1979; Miller and Van Maanen 1979; Orbach 1977). As the Federal agency responsible for management of the Nation's marine resources, NMFS's concern with social impact issues was elevated to a new level when Congress passed the Sustainable Fisheries Act in 1996 (Public Law 104-297). The Act included a requirement that management take into consideration the importance of fishery resources to fishing communities, codified as National Standard 8 of the Magnuson-Stevens Fishery Conservation and Management Act (MSFCMA).

Until recently, NMFS's response has largely been to consider these requirements met by economic analyses which are already prepared under other policy analysis and disclosure laws such as the National Environmental Policy Act (42 USC § 4321 et seq.), the Regulatory Flexibility Act (5 USC §601 et seq.), and the Regulatory Impact Review (Executive Order 12866). Most non-economic social science at the agency has been issue-driven social impact assessment. While there are official guidelines for conducting social impact assessment of specific fishery management plans (NMFS 2001, Vanclay 2006), the program for baseline research is not so clear. It should be as comprehensive as is feasible, and it should address the MSFCMA's selected analytical unit: the fishing community.

We have encountered a number of methodological challenges in carrying out such research across a geographic area as broad as the entire United States West Coast and Alaska. These challenges also involve working within a federal system that carries its own mandates, frameworks, and expectations about what socioeconomic research and data are, traditionally privileging quantitative data attained and analyzed from a distance. While the advantages and policy relevance of long-term in-depth fieldwork in fishing communities has been well documented (Bunce et al. 2000), the challenge in this context is to adapt these practices in a way that maintains their value while carving a space to do so in the practical arena of federal fisheries management.

Scale and Method: Ethnography vs. Geography

Participant observation and ethnography—though by no means limited to anthropology within the social sciences—have nonetheless been our methodological stock and trade (Bernard 2000:320). The anthropological stereotype is of a lone researcher spending months or years in a community in order to understand social phenomena in the ways that local people understand them—in context, and in the local language (Pelto and Pelto 1978). Indeed, Clifford Geertz, one of anthropology's most widely known modern figures, describes "being there" as the central tenet of ethnographic research (Geertz 2000). Most anthropologists still argue for the necessity of spending many months in the field in order to develop sufficient familiarity with complex research issues and to develop enough rapport with research subjects to broach sensitive topics (Creswell 1998; Bernard 2000).

Anthropologists have for some years applied these research tools to natural resource settings. Steward (1955) and Rappaport (1984), for example, both seminal figures in the field, argued for the necessity of analyzing human and environmental systems in tandem. Their goal was to understand the ways in which local environments shape culture and the ways in which cultural practices, in turn, impact the environment. This focus upon both natural and cultural systems has resulted in productive recent works in which scholars bring a multi-cultural lens to environmental research (Milton 1996) and analyze environmental values and actions as cultural phenomena themselves (Brosius 1999).

Marine ecosystems research has figured prominently in this scholarly movement. From the lobster catch in Maine (Acheson 1988, 2003), to the oyster harvest of New Jersey (McCay 1998), to the tuna landed in southern California (Orbach 1977), anthropologists and other social scientists have endeavored to understand the intersection between local communities and fishery resources. Their theoretical contributions have been as varied as their geographical foci, and have led to advances in understanding territorial behavior among marine resource users (Acheson 1975), cooperative management regimes (Berkes 1989; McCay and Acheson 1987), the sense of occupational community among fishermen (Dewees and Hawkes 1988; Miller and Van Maanen 1979), information sharing among fishermen (Orth 1987), and the capacity for diverse interests to find commonality with respect to marine threats (Paolisso 2001).

The research commitments required of ethnographic methods have been particularly useful in small-scale societies that are not well suited to other social science research methods. Ethnographic methods have been employed in larger communities as well, though the focus is often on a smaller subset within the urban social group. In these diverse contexts, participant observation and ethnography can yield incredibly rich information, but to do so effectively requires a serious investment of time *in situ.*

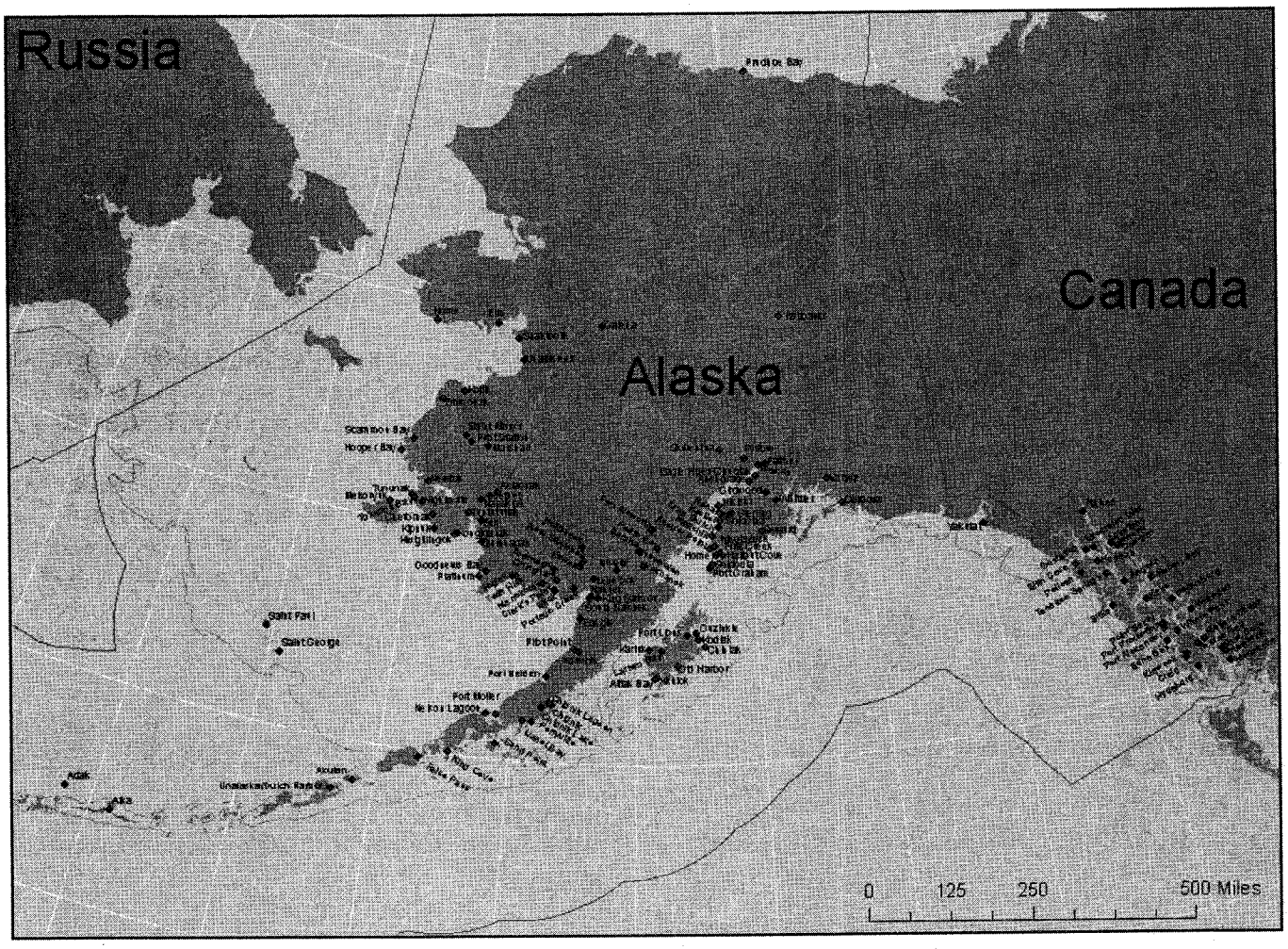
In tension with the time and field work commitment of ethnography is the large geographic scale of many Federal programs, including fishery management plans implemented by the Regional Council system under NMFS. From Alaska to California (the North Pacific and West Coast Regions) there are thousands of communities that participate in fisheries in some way, and hundreds of these are significantly involved in commercial, recreational and/or subsistence fisheries. Each community has a different history, ethnic composition, trajectory of economic development, and social tradition. The expanse of the territory and the specificity of communities for which information is needed conflict on a practical level with the timescale at which detailed ethnography can be undertaken.

Communities Involved in Fishing in the North Pacific and on the West Coast

In order to delineate this tension a bit more, we decided to map out what it might mean to adopt participant-observation ethnography as the primary method in studying fishing communities. In profiling the North Pacific and West Coast fisheries regions, two hundred sixty communities significantly involved in commercial fishing were selected using a multidimensional model measuring fisheries involvement: 136 communities in Alaska (Package and Sepez 2004, Sepez 2005, Sepez et al. 2005) as shown in Figure 1; and 40 in Washington, 30 in Oregon, 52 in California and 2 in other states, as shown in Figure 2. With three months field work in each community (still a truncated period, since the amount of time an anthropological purist might devote to a fieldwork project is at least twelve months), we estimated that a typical participant-observation-based ethnography encompassing these 260 fishing communities would require about 65 years of field work—twice as long as a long federal service career. If we shorten the allotted time even further from three months to three weeks, it would still take 15 years of non-stop field work. At three days per community, it's still more than two years.

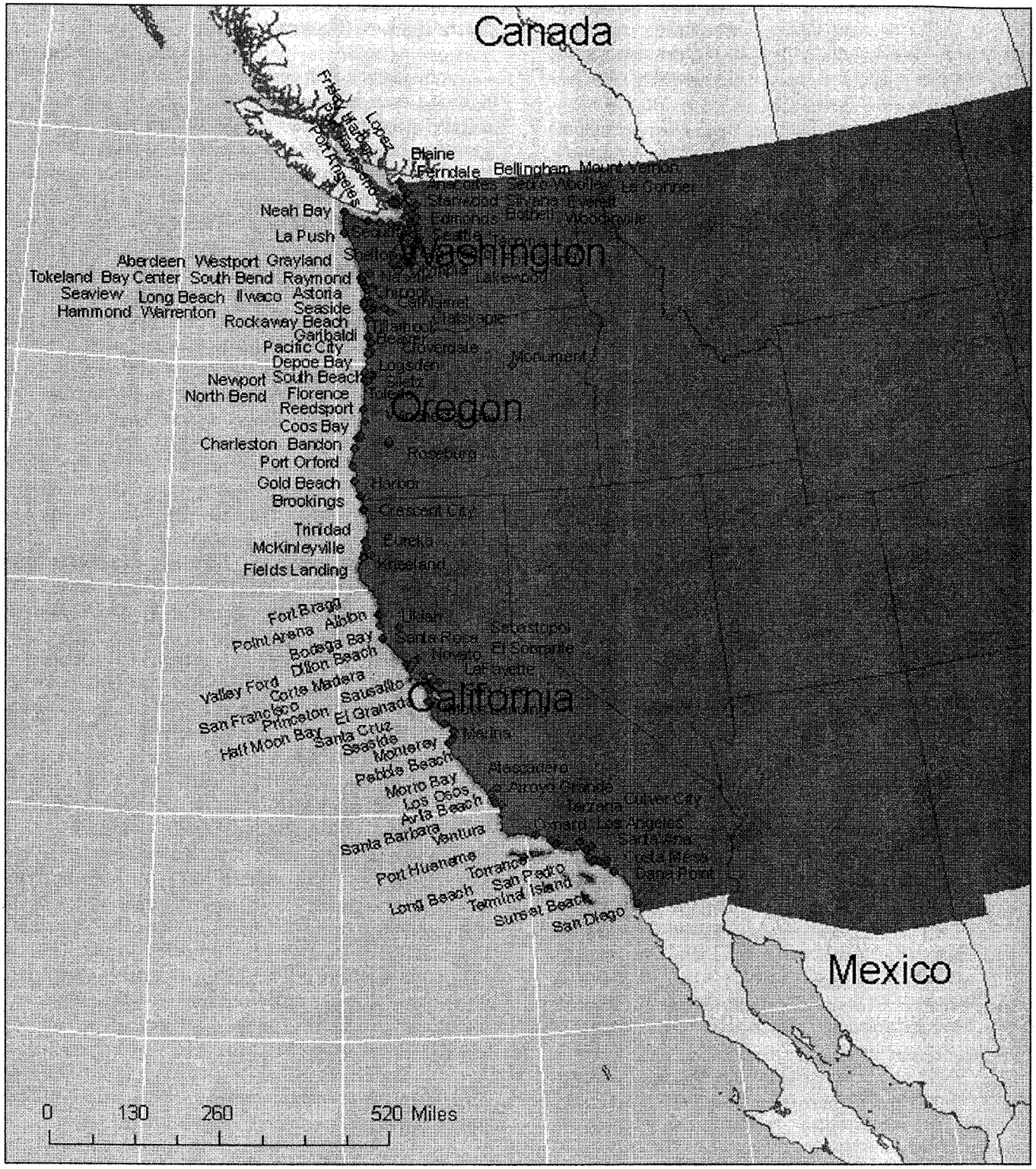
Obviously, there is a need to adapt the method to the scale of the area requiring study. Given the constraints of two full-time researchers (one at the Alaska Fisheries Science Center and one at the Northwest Fisheries Science Center), and unpredictable funding from year to year for research assistants, the remedial options are relatively straightforward: 1) we could use conventional ethnographic methods, but conduct research in fewer communities; 2) we could conduct research in more of the communities, but spend even less time in each one; 3) we could alter the methodological approach completely, and conduct research on

Figure 1. Selected Communities Involved in Fishing in Alaska



Map by Angie Greig (NMFS).

Figure 2. Selected Communities Involved in Fishing in Washington, Oregon, and California



Map by Angie Greig (NMFS) and Christina Package (Pacific States Marine Fisheries Commission).

these communities without actually spending time in them. At the Alaska Fisheries Science Center and the Northwest Fisheries Science Center, we have elected to do a little of each. The patchwork of approaches and methods described below each have advantages and disadvantages, and they reflect the way data collection in the context of fisheries management is an evolving project that has had to be responsive to both geographic and social scales.

Selecting Fewer Communities

Taking all and only those communities listed as an officially designated "Place" in the 2000 US Census, there are 2,261 communities in Alaska, Washington, Oregon, and California. As mentioned above, we used quantitative fishing information to select 260 of these that had a significant involvement in commercial fisheries. We then employed two slightly different strategies for selecting among the 260 for fieldwork, but both were based on dividing the large area into regions and selecting a small number of representative communities within each. This approach of selecting communities within partitioned regions was similar to that employed by Wilson et al. (1998) in their social impact assessment of the highly migratory species management plan, which covers a similarly wide geographical area (from Maine to Puerto Rico).

In Alaska, with its huge size and high number of communities involved in fisheries, the Alaska Fisheries Science Center researchers divided the state into five regions based on geographic boundaries, and selected two communities from each region—one "large" and one "small"—to represent the area. We focused first on the area most heavily involved in federal commercial fisheries, Southwestern Alaska. The two communities visited were Unalaska/Dutch Harbor with a core population of about 4,200 people (large by Alaska standards) and Chignik Bay with a population of 79 (U.S. Census Bureau 2000). Other regions within Alaska will be attended to in the future. For Washington, Oregon, and California communities, the Northwest Fisheries Science Center used the state boundaries themselves as regions. Communities were then selected for site visits within each state based on fisheries involvement and accessibility. Visited communities included Friday Harbor, WA, Ilwaco, WA, Warrenton/Astoria, OR, Port Orford, OR, Moss Landing, CA, San Pedro, CA, and San Diego, CA.

The benefit of this approach is that it partitions the study area into manageable pieces. The problem is that the selected communities are not necessarily representative of other communities in the area. For example, while size is an important general factor for grouping similar communities, other elements may be equally important, such as ethnic composition, facilities and services, socioeconomic structure, and ecosystem characteristics. Such case studies are thus limited to being an *example* rather than being *exemplary* of communities in the state or region. However, in future research, community data could be used in a cluster analysis of all 260 communities involved in fishing. Such an analysis would present a methodologically defensible means of selecting a smaller number of exemplary communities for fieldwork from among the 260 (Johnson 1990).

Spending Less Time in Selected Communities

In addition to focusing on fewer communities, both Science Center teams also elected to spend less time in the selected communities. In Alaska, a team of three anthropologists spent two and a half to three weeks in each location, rather than three months or longer. They found that after about two weeks of key informant interviews and participant observation, the rate of new information began to level off. It was their sense that more time in the community would have led to a deeper understanding of social dynamics, but that to reach that next level of insight would take considerably more time. In the Northwest and California, each researcher spent a few days for each community visit—just long enough to assess the fisheries infrastructure (docks, processors, etc.), complete a few interviews, and acquire a sense of the local ethos.

Another viable alternative method for spending less time in selected communities is the interdisciplinary Rapid Assessment Process or RAP. Beebe (2001, 2005) defines RAP as "intensive, team-based qualitative inquiry using triangulation, iterative data analysis, and additional data collection to quickly develop a preliminary understanding of a situation from the insider's perspective" (2005: 285-286). While RAP and related methods were originally conceived primarily as a basis for judging the efficacy of rural development projects in agricultural settings, in recent years the techniques have proven quite useful within marine and coastal environments (Lamug 1994; McCracken 1990). Pido et al. (1996) developed a methodological framework for conducting rapid assessment research of fisheries management systems. Their approach underscores the need for on-the-ground cooperation between the researchers and local communities.

The recommended RAP research time frame is five days to six weeks for the entire process. However, the research requires a team effort, preferably a multidisciplinary effort that also includes at least one "insider." In terms of budgets and person-hours, that means multiplying the days in community by the extra personnel costs. Five days (minimum) for five people (recommended) is equivalent to 25 per diem days. Although Beebe (2005:285) contends that RAP produces results at less cost than traditional qualitative research, it is not clear to us that this claim is supported in terms of cost per unit of results. The real savings in RAP is of time, not necessarily money. That makes RAP a good method for social impact assessment and an important tool where insider perspectives are a main target of research.

Compiling Social Indicators

The third approach we have used to confront the ethnography/geography predicament is the compilation and analysis of social indicators, especially quantitative indicators,

which we have used to describe fishing communities involved in fisheries of the North Pacific and West Coast.

Social indicators are sets of variables used to estimate the economic and social conditions in a community at a given point in time. Researchers have used social indicators since at least the 1960s to estimate various research parameters of interest, such as racial composition, religion, income and employment, and health status, in order to "understand large-scale structural change in American society" (Moore and Sheldon 1965). Moreover, social indicators have become more nuanced and more accurate through the iterative process of repeated research (Gahin and Paterson 2001). As a policy-making tool, social indicators have proved useful in forecasting economic change, allocating resources, directing social intervention programs (Ferris 1988), and assessing sustainability (USDA 2003).

It should be noted, however, that the use of social indicators has fallen in and out of favor with social scientists over the years (Cobb and Rixford 1998). Research based on social indicators has been criticized for under-representing certain subpopulations and for choosing proxy variables that poorly represent the social phenomenon being measured (Diener and Suh 1997; Cobb and Rixford 1998). Some researchers contend that, while social indicators have merit as educational tools, their usefulness in policy formulation is limited (Gahin and Paterson, 2001). The concern is that practitioners have not been able to develop truly meaningful indicators.

Weighing these concerns against the benefits of gathering data on a large number of communities, we elected to gather indicators that would meaningfully illustrate important local conditions. We limited ourselves to indicators that had already been collected and processed at the community level, yet our choice of indicators was informed by field visits and primary data that suggested significant social, economic, and political parameters. We emphasized extant data sources of information on demographics, infrastructure, and fishing activities (Table 1), rather than quality of life indicators or other measures that are not available and would therefore require extensive field research to collect.

The value of using indicators to profile hundreds of communities, as we have done, is three-fold. First, we were able to include communities in our analysis that had previously gone unexamined. For many communities, our profiles provide the only systematic compilation of information available about social, economic, and fishery conditions. Previously, economic analyses were compiled for the West Coast and North Pacific Regions (See, for example, Northern Economics Inc. 2001), while community level analyses have generally been isolated to those communities deemed most likely to experience the most significant impacts when changes are made to fishery and management policies. Second, we provided a breadth of information that allows for comparisons to be made across communities and regions. The benefits for policy formulation and for social science research are considerable. Third, the compiled indicators can be analyzed to reveal patterns across variables and communities, leading to factor based community typology (Robbins and Pollnac 1969—then called "item analysis"). We consider this third benefit to be a next step in the profiling project. Once community types have been identified by their patterned variations, sites for ethnographic work can be selected in a much more disciplined and presumably instructive manner (Johnson 1990).

Naturally, profiling this many communities has its limitations, including a lack of ethnographic depth and the perpetuation of the inevitable inaccuracies contained in any very large database. However, while this approach is the most distanced from ethnographic methods, it directly serves the legal mandates of the MSFCMA and provides primary input for the descriptive requirements of the National Environmental Policy Act.

Redefining Communities

Many scholars (e.g., National Research Council 1999; Wilson et al. 1998) have pointed out that communities formed around something other than place may be fundamental to understanding social impacts. Communities—cast as commonalities—can include interest groups, membership associations, social classes, and other groups of individuals bound together by something other than place. In this sense, fishing communities may be gear groups, fishermen's associations, boat-size classes, and other fishing-related linkages (however, see Jacob et al. 2005:383-4 for a criticism of this approach).

Also veering away from the contiguous settlement or municipal jurisdiction sense of community has been much of the economic research that provides baseline and support information to policy-makers; regional and often county-level economic data is available nation-wide, but rarely available by community. These larger place-based aggregations can sometimes obscure important effects on individual communities within the region. Because of the way the data are collected and reported, disaggregation to the community level is not possible.

Unfortunately, redefining communities as commonalities or aggregating communities at larger geographic levels are not viable options for addressing the agency's interpretation of the Magnuson-Stevens Act. National Standard 8 of the Magnuson-Stevens Act stipulates that management decisions: "shall take into account the importance of fishery resources to fishing communities..." (16 U.S.C. Ch. 38 (IV) §1851(a) (8)). The Act specifically defines a fishing community as: "a community which is substantially dependent on or substantially engaged in the harvest or processing of fishery resources to meet social and economic needs, and includes fishing vessel owners, operators, and crew and United States fish processors that are based in such community" (16 U.S.C. Ch. 38(I) §1802 3 (16)). Under this definition alone, many people have suggested that studies do not need to focus exclusively on place-based communities. However, NMFS interprets the law in the following manner in its official guidelines:

Table 1. Out of Community Profiles Based on Indicators

Document Section	Indicators
Location	Description of geographic location Area (both land and water) in square miles Latitude/longitude coordinates
Demographic Profile	Number of inhabitants Short history of demographic change Gender structure Median age and age structure Educational levels of residents 18 years and over Percent of residents living in family households Racial/ethnic composition Percent of residents who are foreign-born ancestry
History	Brief account of local history
Infrastructure	Current economy • Major businesses • Sectoral analysis of employment • Median household and per capita income • Description of subsistence activities • Percent of residents below poverty level • Number and occupancy status of housing units Governance • Form of city government and type of incorporation • Taxes • Village or tribal governance structures • Regional governance structures such as community development quota groups • Distance to nearest governmental enforcement offices: NMFS, state Fish and Wildlife, U.S. Coast Guard, U.S. Bureau of Citizenship and Information Services; Pacific and North Pacific Fisheries Management Council meetings. Facilities • Connectivity (roads, airports, ferries, and relevant fares) • Marine facilities • Schools • Health care facilities • Lodging accommodations • Police and public safety services • Public utilities
Involvement in West Coast Fisheries	Commercial Fishing Landings Data • Number of unique vessels delivering fish landings • Landing vessels by participant group (commercial, aquaculture, tribal, personal use) • Weight, value and number of vessels delivering landings by federal management groups Vessel Data • Number of vessels owned by community residents • Number of vessels participating in federal buy-back program • Number of vessels participating in federally managed groundfish fishery • Number of local vessels participating in various fisheries

(cont.)

Involvement in West Coast Fisheries	Commercial Fishing (cont.) Community Member Participation • Local residents holding federal groundfish fishery permits • Local residents holding permits for various fisheries, by state Permit Data • Total state and federal permits registered to community residents • Number of federal groundfish fishery permits • Number of state permits held by community residents • Number of permits for various fisheries, by state Processing/Wholesale/Distributor/Retail Data • Number of processors • Annual average people employed by processors in community • Total weight and value of processed fish • Top products, by weight and value, processed in community • Additional data from Web searches, site visits, interviews Tribal Commercial Data • Any available data Sport Fishing • Number of active sport fishing charter businesses in community • Number of sport fishing license vendors • Number of sport fishing licenses sold in community • Sport fish landings • Major species fished Subsistence Fishing • Any available data
Involvement in North Pacific Fisheries	Commercial Fishing Landings and Vessel Data • Volume and value of fish landings by species • Number of vessels delivering fish landings • Number of local vessel owners fishing in North Pacific Community Member Participation • Local crewmembers fishing in North Pacific • Local residents holding state or federal fishing permits Permit Data • Number of state and federal permits issued to residents • Number of License Limitation Program (LLP) and Commercial Fisheries Entry Commission (CFEC) permits held by residents • Number of halibut and sablefish IFQ shares for community residents Sport Fishing • Sport fishing businesses in community • Number of sport fishing licenses sold to residents and non-residents Subsistence Fishing • Alaska Department of Fish and Game subsistence data on subsistence harvesting and use of various species
Additional Information	Tourism, festivals, community organizations, special circumstances, etc.

A fishing community is a social or economic group whose members reside *in a specific location* and share a common dependency on commercial, recreational, or subsistence fishing or on directly related fisheries dependent services and industries (for example, boat-yards, ice suppliers, tackle shops). (50 CFR Chapter VI 10-1-02 Edition p. 43, Section 600.345 (b) (3), emphasis added).

This last mandate obviates the possibility of approaching communities as non-placed based commonalities. This is not to say that communities of commonalities are not important in understanding the social dynamics of fisheries systems, but rather that at the agency we must first attend to what is mandated in the law. Communities must be treated as place-based entities, a definition that frames the choices of method

described above. Analysis of non-place-based "communities" can and should be conducted during social impact assessment when they are determined to be important, but such analysis alone would not fulfill the legislative mandate as interpreted by NMFS.

Despite this constraint, it is still possible to analytically interrogate the meaning of community in terms of not only geographic scale but social scale as well. Consequently, our choice of methodology reflects an attempt to account for an imposing number and diversity of place-based communities throughout the regions, but it also involves an attempt to analytically incorporate social scales, as any local community exists in a nested framework of micro and macro level dynamics.

Scale and Unit of Analysis

One valuable contribution of studies focused on geographic communities is that they provide a departure, as mentioned, from standard economic analyses that aggregate data at far broader levels. Regional or sector analyses may overlook the specifics of communities that can be impacted quite unequally by broad-based resource management policies (Jacob et al. no date: 4). In recognizing the importance of community-level dynamics, however, a critical question emerges that involves not only the specifics of methodology as mentioned, but also the scope and scale of analysis. What does community-level research capture and what does it miss? How is it made most meaningful to federal requirements mandating a consideration of both social impacts and issues of equity?

Communities of place are critical to crafting policies responsive to the social impacts of resource regulation. It is just this sort of approach that represents a community as regionally distinct, and indicates the specific fisheries and areas important to those who live and work in the community. However, it has long been recognized within anthropology that communities do not speak with a single voice; socially significant sub-groups, or "pockets" (EPA 1998:16), indicate the internal heterogeneity of communities and their uneven terrains of resource access and distribution. Nor are communities social or economic islands. They participate in and are shaped by broader global or regional (macro) political economic processes that have historically led to shifting demographic patterns and levels and types of resource use. Although the research focus is on a community as a place and as a research unit, it is important to have a scope wide enough to include these other phenomena.

In order to deal with intra- and extra-community dynamics, many researchers advocate for the importance of studying the coexistence of multiple scales—using classifications of local/national/international or adopting more of a continuum between the poles of local and global (Ghai and Vivian 1995; Peet and Watts 1996; Bryant 1998). To avoid drawing a simplistic distinction between local and global while still accounting for the different ways social processes impact and arise from various scales, we follow the work of Smith (1992) and writers on the environmental justice movement who suggest that we "conceive of the relationships between scales in terms of a nested set of levels" (Williams 1998:52). From this perspective, community information must be nested within both macro and micro scales for it to be of full analytical value. This is particularly important in the case of social science that supports the formulation of policy, since key variables such as ecological conditions, marine resource stocks, economic conditions and cultural values all cut across geographic and regulatory scales.

Macro Scales

Anthropology's traditional focus on the local does not mean that it has been left behind by the surge of social scientific discourse on globalization—a phenomenon that, as Kearney notes, "refers to...processes that take place within nations but also transcend them, such that attention limited to local processes, identities, and units of analysis yields incomplete understanding of the local" (Kearney 1995:548). Anthropologists have responded to globalization by reorienting their tools and approaching spaces of fieldwork, once a "mosaic of separate cultures" (Gupta and Ferguson in Kearney 1995:556), with an awareness of the ways in which these porous places are constituted across scales (Gupta and Ferguson 1997). However, a persistent ethnographic attention to local specificities has also provided important critiques of some of the more cavalier claims of globalization and its power to "conquer the local space of places" (Peña 2001:1) in its wake, relentlessly homogenizing cultures, landscapes, and markets.

Macro-scale analyses take one of two forms. First, they can examine a community, not as a synchronic isolate, or even in terms of Beebe's (2005: 286) "insider perspectives," but in terms of other communities, regionally, globally, or perhaps even historically. Or second, they can look at how forces that transcend the community of place play out in the local context, as with globalization of trade regimes, and transnational or regional labor migration patterns. In other words, macro-scale analyses push us beyond the local geographical unit to look at a community's place in the larger picture, and how the larger picture manifests in the community.

For example, the contiguous Oregon communities of Astoria and Warrenton are, taken together, one of the most significant fishing ports on the west coast. Historically significant in terms of the salmon fishery, local involvement in fishing is presently diverse, with landings of groundfish, sardines, tuna and crab in evidence (Langdon-Pollock 2004). In the Northwest Region, a macro-scale analysis of existing data shows that Astoria/Warrenton is the most prominent community in terms of commercial catch landings. This is true when speaking of pounds landed, where, at nearly twelve times the mean quantity landed for west coast ports, Astoria/Warrenton's year 2000 data exhibit the largest

Table 2. Top Seven West Coast Commercial Fishing Ports of Landing by Millions of Pounds for the Year 2000

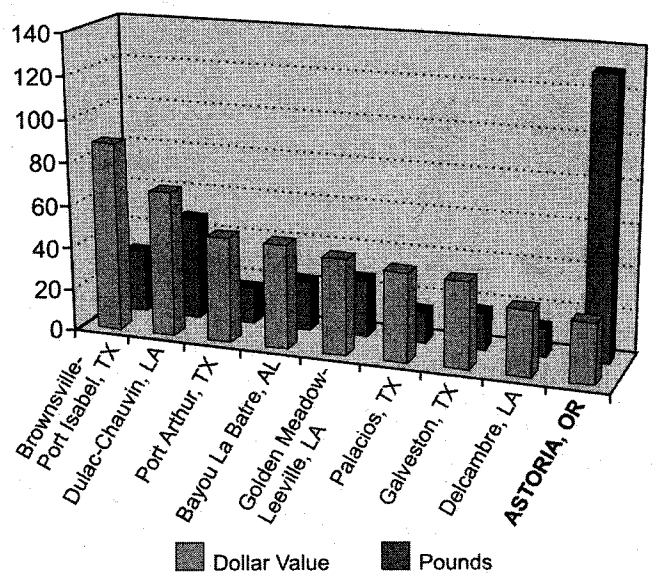
Rank	Port	Pounds of Fish Landed
1	Los Angeles, CA	254.7
2	Port Hueneme-Oxnard-Ventura, CA	162.2
3	Astoria, OR	130.1
4	Newport, OR	102.3
5	Moss Landing, CA	50.5
6	Ilwaco-Chinook, WA	19.8
7	Bellingham, WA	18.0

Source: NMFS 2002:7.

quantity of fish landed anywhere in Washington or Oregon (Table 2). But this is also true when speaking in economic terms, with Astoria/Warrenton's revenues from landed fish again at the top for west coast ports. However, as shown in Figure 3, the picture is a bit different when viewed through a national lens. While Astoria/Warrenton has been consistently in or very near the nation's top ten fishing ports in terms of volume since 2000, it is surpassed by many more ports in terms of value, with pre-Katrina Gulf Region shrimping communities playing a large part in that reordering (NMFS 2004:7, NMFS 2003:7). As globalized phenomena such as salmon and shrimp aquaculture, groundfish market development, international tuna agreements, and even global warming shape their respective fisheries, so will Astoria/Warrenton be exogenously shaped.

Looking further north, Dutch Harbor/Unalaska (Figure 4, Figure 1) has consistently been the nation's number one or number two fishing port in terms of both volume and value (NMFS 2004:7, NMFS 2003:7). When examining this community, it quickly becomes clear that attentiveness to community levels need not view the local as either subsumed by homogenizing global forces or existing as a defensive bulwark. Drawing from AFSC ethnographic research in Dutch Harbor, a rich community analysis is possible only through addressing a number of macro-level dynamics that have historically influenced community demographics, social life, and patterns of participation in the fishing industry. These include: 1) shifting resource management regimes at state, federal, and municipal levels—all of which have both short- and long-term consequences on the livelihoods of community members; 2) successive waves of occupation and resource extraction—which have created a turbulent timeline of boom/bust cycles, from the Russian and American colonial fur trade to militarization during WWII, the dramatic collapse of the lucrative Alaska king crab fishery in the 1980s and subsequent phenomenal success of the pollock industry; and finally, 3) growth of a transnational population (Figure 5).

Figure 3. Astoria's Higher Volume and Lesser Value of Landings than Many Gulf Region Ports



Source: NMFS 2002.

Micro-scales

At the other end of the spectrum, micro-scales of analysis seek to penetrate the illusion of a homogenous community by examining internal community dynamics that are often interwoven with macro-scale forces. Even as their place names suggest, Dutch Harbor/Unalaska and Astoria/Warrenton may not be neatly classified as single places, with internal tensions over appropriations of geography, economic goods, and history inscribed in the disunity of the appellation.

For example, unlike other small Aleutian villages, a place like Dutch Harbor/Unalaska is hardly lost in the macro-scale—with its dominant role in regional and US fisheries (NMFS 2002). However, on the other end of the nested scale framework, collecting and reporting about the "community" of Dutch Harbor/Unalaska may miss intra-community dynamics. Each season, hundreds of longliners, trawlers, and crabbers participating in the Bering Sea fishery converge on Dutch Harbor—most coming from Seattle, Oregon, and other parts of Alaska. Participation of a locally owned small-boat fleet like the 36 vessels organized under the Unalaska Native Fisheries' Association (UNFA) would hardly surface on the radar of the community profiles. Only fieldwork in the community revealed the importance of this micro fleet. These boats, the largest of which is 68 feet, generally jig, longline, and gillnet interchangeably, from a port dominated by trawlers that are hundreds of feet in length. UNFA has recently managed to obtain a herring gill-net quota for the small boat fleet, along

Figure 4. The Community of Unalaska with a Container Ship at the International Port of Dutch Harbor in the Background

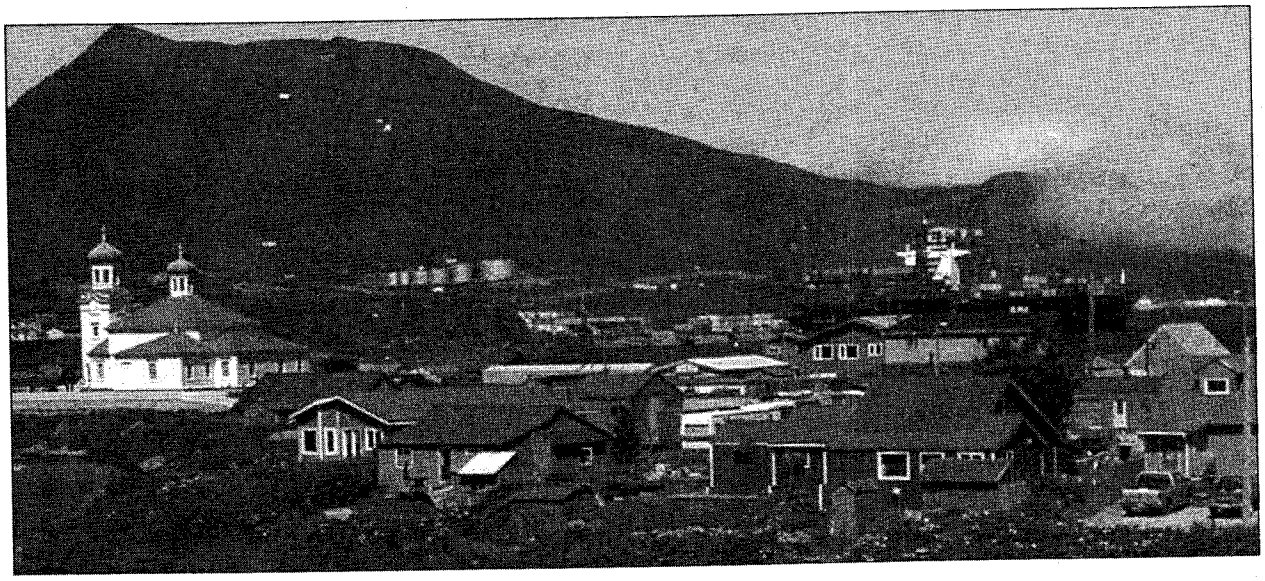


Photo by Jennifer Sepez and Palma Ingles (NMFS).

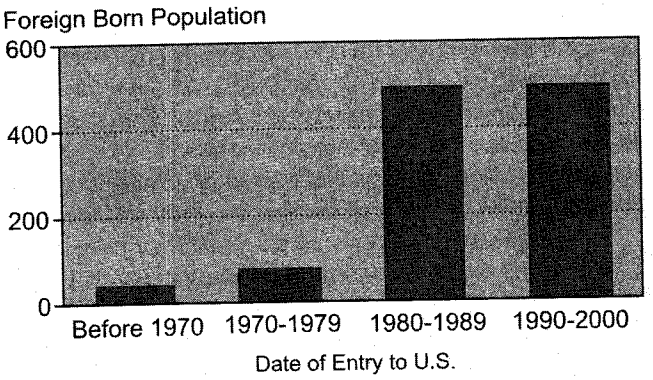
with a 2% quota of local cod. Both of these fisheries would be essentially insignificant in overall North Pacific harvest. However, because UNFA comprises one pocket within the community that holds a disproportionate amount of long-term locals and Native Alaskan fishers, effects on this small pocket are magnified in the local social landscape.

Much like Dutch Harbor/Unalaska in the North Pacific, Astoria/Warrenton would not fail to register on the radar screen required of the Northwest's macro-level analysis, simply because of its position as a center for fishing vessel landings. However, the standardized format of the large-scale community profiling project cannot shed light on some of the more subtle yet critically important inner workings of a fishing community. After agency "scoping" work in various northwest fishing communities and at fishery management council meetings, the NWFSC selected a number of northwest communities for short-term field visits, including Astoria/Warrenton. As with the AFSC team, NWFSC researchers spent an abbreviated period in the community.

Only in the Astoria/Warrenton field visit did the NWFSC research team uncover the significance of an impending regulatory change for a pocket of groundfish fishermen. The Oregon Trawl Association (OTA) and the Fishermen's Marketing Association (FMA) are two fisheries institutions that served to segment local fishermen according to their involvement in and utilization of these organizations. A federal management plan to buy out groundfish fishermen in order to reduce the size of the fleet was particularly salient for this local pocket within the Astoria/Warrenton fishing community, and many fishermen who featured in this social network had submitted bids to the government in order to participate in the buy-back (Courtney Carothers, NMFS NWFSC, personal communication). When the NMFS groundfish buy-back was realized, not only was the fleet size reduced, but the knowledge and organizational involvement of many long-time fishermen ceased to be present in the fishery, diminishing institutional capital in the community.

Moreover, the pockets within the Astoria/Warrenton community of fishermen, which existed according to processor

Figure 5. Growth of Transnational Population in Dutch Harbor/Unalaska, by Years of Entry



Source: 2000 Census.

loyalties emerging out of involvement in the FMA, would not have been visible through the examination of quantitative data aggregated at the community level. Because involvement in the FMA affects price stability and competition between fishermen, differential regulatory impacts are clearly possible for different fishermen subpopulations, depending upon the particular social segment's links to the FMA. The use of field visits and key-informant interviews was critical to developing this understanding of Astoria/Warrenton.

Discussion and Conclusion

Tasked with researching West Coast and Alaska "fishing communities" such that policy decisions could rely upon a more solid baseline, NMFS anthropologists have had to contend with tradeoffs in each methodological and analytical decision made along the way. The problem with the fishing community as the primary unit of analysis in fisheries social science is that it gives us at the same time both too wide a potential analytical pool, and too narrow an analytical framework.

The social and fishery indicator approach used by NMFS social scientists clearly addressed the need for comprehensive geographic coverage. The number of communities linked to fishing in these areas is vast, and ethnographic depth was not feasible for even a small percentage of these communities. In opting to use social and fishing indicators to select broadly and thereby profile numerous communities, we exchanged extensive investments in ethnographic detail for great geographic breadth. This coverage extended even to communities located within non-Pacific Coast states, but which participate in Pacific and North Pacific fisheries. The compilation of indicators further promotes additional community examination by permitting comparison to similar data in other regions and by enabling factor analysis of variability within the region.

The employment of a Rapid Assessment Process (RAP) in community analysis might have allowed for more detailed and ethnographically informed community profiles. An RAP approach may also have been a means of examining and describing a number of communities within a time frame that would suit policy needs. Nevertheless, the potentially expensive team-centered design of RAP, as well as the "insider" requirements and results, indicate that it might be best suited for issue-driven social impact assessment.

Nevertheless, in profiling communities, we were not willing to dismiss the ground-truthing strength of ethnographic approaches. With brief community visits supplementing the use of social indicators, ethnographic detail may not have been extensive, but it was not foregone altogether. The ethnographic detail that we did gather was enriched by placing it into or contrasting it to the broader context illuminated by social indicators.

We also advocate slipping the chains of the bounded community to analyze locations in a porous nested-scale framework that recognizes intra-community heterogeneity and attends to the manifestations of large-scale social, economic and ecological forces within communities.

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